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AGRICULTURAL FINANCING AND ECONOMIC DEVELOPMENT IN NIGERIA (1986-2015): A DISAGGREGATE ANALYSIS

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Abstract: **It is evident that government in Nigeria have over the years spent huge amount of money in financing agriculture through its various programmes with main theme of achieving inclusive growth and sustainable development. But surprisingly, that has not translated to meaningful development in Nigeria. It is on this baseline that, this study investigates the relationship between agricultural financing and economic development in Nigeria using annual data from 1986 to 2015. Financing of agriculture is disaggregated into individual, co-operative and company base agricultural financing. This study further applied Autoregressive Distributed Lag (ARDL) model for analysis. The results show that individual and company base agricultural financing have positive impact on economic development, while co-operative base financing and commercial banks loans to agriculture have negative impact on economic development. This study recommends the need for government to channel more of its funds to individual and company base agricultural financing. Additionally, commercial banks should redesign their existing policy on how the loans to agriculture are issued and effective monitoring and supervision should be given on how the loans are been spend.**

Keywords: **Agricultural Financing, Economic Development, ARDL, Nigeria.**

1. INTRODUCTION

Agricultural sector is seen as an engine that contributes positively to inclusive growth and sustainable development of the overall economy of nations. The sector contribute to provision of food for human consumption, employment generation, sources of raw materials to our local industries, foreign exchange earnings, creates market for industrial goods and sources of revenue to government. Others include; provision of materials for shelter, provision of materials for clothing, generation of income for farmers, deployment of towns and provision of facilities for recreation and tourism. However, the sector is faced with numerous challenges, which include, paucity of loan funds, inadequate funding of public agricultural financing institution, low level of skills to deliver effective services to the sector. It is therefore, imperative that adequate financing and management of the agricultural sector be emphasized.

Historically, it has been documented that massive investment in agriculture is one of the necessary conditions for economic growth in every economy especially developing ones. For instance, in Nigeria, agriculture was the leading sector prior to the oil boom, contributing about 63% and 54% to GDP growth rates in the 50s and 60s respectively and has the capacity of employing about 65% of the total labour force in the country. Similarly, the share of the sector to GDP has declined to an average of 29.2% between 1970 and 1980, 33.3% between 1980 and 2000, and 41.2% between 2001 and 2009. These declines in the sector's contributions to the growth rates of national output are associated with discovery of oil in commercial quantity in the 70s (Emeka; 2007 and CBN; 2011).

In response to these unwanted declines in the contributions of the sector to national development, the different Nigerian government regime established many institutions, programmes and schemes with main aim of channeling enough finances to the sector in order to achieve positive progress. Among the institutions are: Nigeria Agricultural and Cooperative Bank (NACB) in 1973, River Basin Development Authority (RBDA) in 1977, Directorate of Food and Rural Infrastructures (DFRRI) in 1986, Nigerian Agricultural Insurance Cooperation (NAIC) in 1987, People's Bank of Nigeria (PBN) in 1990, Community Bank (CB) and Microfinance Bank from 2005 to date. In the same vain, the programmes such as Agricultural Development Programme (ADP) in 1975, Operation Feed the Nation (OPN) in 1976, Green Revolution in 1980, Family Economic Advancement Programme (FEAP) in 1997 and the National Poverty Eradication Programme (NAPEP) IN 1999 were set up to support the sector to move to a greater height. Additionally, agricultural financing schemes such as Agricultural Credit Guarantee Scheme Funds (ACGSF), Agricultural Credit Support Scheme (ACSS), Commercial Agriculture Credit Scheme (CACS) and Anchor Borrowers' Scheme were introduced in the year 1977, 2006, 2009 and 2015 respectively to revive the sector (David; 2011, Nwankwo; 2013 and CBN; 2016).

Regardless of numerous efforts made by the governments through the introduction of agricultural financial institutions, programmes and schemes, the sector's contributions to economic growth continue to decline. According to CBN (2015), agricultural sector contributes 11.86%, 38.09% and 12.73% to the growth rates of GDP in Nigeria in 2011, 2012 and 2013 respectively. Furthermore, it accounts for about 15.38% in 2014 and 32.14% in 2015 shares to GDP growth rates in the country. It was observed that, the decline in the contribution is not unconnected with factors such as paucity of loan funds, low management of capacity of farmers, lack of adequate skills to deliver Effective services, inadequate funding of public agricultural financing institutions among others (David, 2011).

Empirically, similar studies were conducted by Obansa & Madukwe (2013), Nwankwo (2013), Atagana & Kalu (2014), Agbada (2015) and Patricia (2016), these studies failed to employed robust econometric techniques, instead they applied Ordinary Least Square (OLS) in their analysis. This study adds value to the existing studies by employing robust and one of the most recently developed econometric technique of Autoregressive Distributed Lag Model (ARDL). The study also included new time series (study period) from 1986 to 2015, which were excluded in the previous studies in the Nigerian economy.

The objective of this study is to examine the relationship between agricultural financing and economic development in Nigeria. For that the study is divided into five sections including this introduction. Section two and three comprises review of related literature and methodology respectively. Discussion of findings, conclusion and recommendations were presented in section four and five accordingly.

2. REVIEW OF RELATED LITERATURE

Agricultural Finance is a branch of agricultural economics that deal with the provision and management of services and financial resources related to individual farm unit. It also involves the study of all economic and financial interactions between agriculture and entire economy. Agricultural finance is one of the services provided by the financial institutions such as deposit money banks, specialized government organizations (i.e. federal ministry of agriculture, state ministry of agriculture, etc.) and informal financial institutions like local thrift collectors (loan association) and cooperative bodies (Atagana & Kalu; 2014). In another development, Obansa & Maduekwe (2013) opined that agricultural financing is the public or private resources such as loans or aids from outside the country allocated to agricultural sector in order to realize social welfare development in the sector and whole economy. It comprises both the government and non-governmental organization's funds that are being used to promote community and sectorial development, local empowerment and reduction of income inequality. It is a form of long term financing that aims at bringing agriculture-led growth and development in an economy.

Agricultural financing is one of the important development strategies that can be financed from either formal financial institutions or informal financial institutions. Institutional finance to agriculture comprises financial institutions such as deposit money banks, World Bank, African Development Bank (ADB), Trust Funds, International Food and Agricultural Organization (IFAD), Central Bank of Nigeria (CBN), Bank of Agriculture, Microfinance Banks etc. whereas non-financial institutions finance to agriculture can be inform of credits to farmers from relatives, friends, money lenders, personal savings (Asus) among others. According to Atagana & Kalu (2014) non institutional sources to agriculture in Nigeria accounted for about 70% of the total credits received by the farmers.

Empirical studies relevant to this area were conducted within and outside Nigeria. For instance, Enu (2014) studied the impact of agricultural sector on economic growth in Ghana using annual data from 1996 to 2006 where he applied Ordinary Least Square in the analysis and results indicated agricultural sector has a significantly positive effect on economic growth.

Similarly, Nwankwo (2013) applied OLS to investigate the contribution of agricultural financing on economic growth in Nigeria for the period spanning from 1990 to 2010. He found that financing of agriculture has contributed positively to economic growth in Nigeria. The study recommended the need to reduce the interest rate in agricultural loans in order to motivate the farmers to increase their investment in the sector. Employing OLS and Granger Causality test, Obansa and Maduekwe (2013) also examined the effect of agricultural financing on economic growth in Nigeria. Their result revealed the evidence of bidirectional causality between agricultural financing and economic growth.

In the same vein, Joseph (2014) investigated the interactions between finance and growth in agricultural sector in South Africa and in the estimation, the study made use of Structural Equation Model (SEM) and revealed that short-term and long-term financing have positive contributions to farmers' productivity. Poonyth, Hassan, Kirsten & Calcaterra (2001) equally, carried out a study on the effect of agricultural sector on economic growth in South Africa. They found that 1% growth in agricultural sector lead to more than 1% growth rate of the economy.

Atagana & Kalu (2014) assessed the association of agricultural credit and economic growth in Nigeria, where they found that guaranteed loan to agriculture has positive and statistically significant influence on economic growth. Agbada (2015) when investigating the relationship between agricultural financing and national output in Nigeria from 1982 to 2012 applied multiple regression analysis and found that agricultural financing is positively associated with national output. Similarly, Joseph, Anderemi & Ademola (2015) analyzed the importance of commercial banks loan to agricultural sector in Nigeria, their study covered the period from 2002 to 2014 and found that commercial banks loan does not have positive consequence on agricultural development in Nigeria throughout the study period. Patricia (2016) conducted a study on the effect of agricultural financing on agricultural output, economic growth and poverty reduction in Nigeria. The study employed OLS using secondary data from 1980 to 2010 and the observed that commercial bank credit and agricultural credit guarantee scheme loan have positive influence on agricultural output in Nigeria. The study recommended the need for agricultural commercialization, subsidy on agricultural inputs and removal of tariff on imported agricultural inputs. Recently, a study was conducted by Kamil, Savine & Futus (2017), they used Vector Error Correction Model (VECM) to analyze the interactions between agricultural sector and economic growth in Nigeria for the period 1981 to 2013. Their findings indicated that agricultural sector has absolute contribution to economic growth.

3. DATA AND METHODOLOGY

This study used annual data from 1986 to 2015 and the data were sourced from Central Bank Statistical Bulletin and World Development Indicators (World Bank, 2016). The choice of the study period is based on the fact that Nigeria adopted Structural Adjustment Programme (SAP) in 1986 and that economic diversification is one of the objectives of the SAP that include the investment in agriculture. The study used Agricultural Credit Guarantee Scheme Funds (ACGSF) as proxy for agricultural financing, this is due to the fact that in Nigeria the most important scheme that was designed and established with the main aim of financing agricultural sector is Agricultural Credit Guarantee Scheme Funds (ACGSF) under the supervision and management of Central Bank of Nigeria (CBN). Therefore, agricultural financing is poxied by ACGS funds and that the funds were disintegrated into different components namely; Agricultural Loans to Individual (ALI), Agricultural Loans to Cooperatives (ALC), and Agricultural Loans to Company (ALP). The study also, included Commercial Banks Loan to Agriculture (CBLA) as an additional variable in order to arrive at robust and reliable estimate. Economic Development is proxied by Gross Domestic Product (GDP) per capita as used by Zoran, Nemanja, Jovonka & Millica (2014). The study borrowed the model from the work of Agbada (2015) with some adjustments. The functional model for this study is given as:

$$GDPP = f(ALI, ALC, ALP, CBLA) \quad \ldots\ldots (1)$$

However, the econometric model of equation is given as:

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$$GDPP_t = \beta_0 + \beta_1 ALI_t + \beta_2 ALC_t + \beta_3 ALP_t + \beta_4 CBL_t + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

In estimating the relations among the series, this study applied ARDL approach developed by Pesaran, Smith & Shin (2001). The reasons for using this approach are: first ARDL can be applied irrespective of whether the variables are stationary at level value I(0) or after first difference I(1) or combination of both (i.e. I(0) or I(1)). Second, it can generate robust and reliable results even if the sample size is small or large. Finally, it produces long run and short run results at a time, Pesaran et al (2001). The ARDL model is given as:

$$\Delta GDPP_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta GDPP_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta ALI_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta ALC_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta ALP_{t-i} + \sum_{i=1}^{n} \beta_5 \Delta CBL_{t-i}$$
$$+ \alpha_1 GDPP_{t-1} + \alpha_2 ALI_{t-1} + \alpha_3 ALC_{t-1} + \alpha_4 ALP_{t-1} + \alpha_5 CBL_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots (3)$$

Note that β0, to β5 and α1 to α5 are the parameters of the explanatory variables. Similarly, the Error Correction Model of the ARDL approach is specified as:

$$\Delta GDPP_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta GDPP_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta ALI_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta ALC_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta ALP_{t-i} + \sum_{i=1}^{n} \beta_5 \Delta CBL_{t-i} + \beta_6 ECM_{t-1} + \mu_t$$

... (4)

The ARDL model has two parts; the first part of the model with β0 to β5 represents the short-run dynamics, while the coefficients α1 to α5 represents the long-run part of the model. The null hypothesis is defined as H0: α1= α2= α3 = α4= α5= 0 which tell us that there is no long run relationship. The study began the analysis by conducting cointegration test of the bounds test in order to find out the evidence of long-run relationship. The calculated F-statistics is compared with the Critical Value as tabulated by Pesaran et al (2001). If F-statistics is greater than the upper critical value, then the decision rule will be to reject the null hypothesis of no long-run relationship, whereas if it falls below a lower critical value, then the null hypothesis cannot be rejected and if it falls within these two critical bounds, then the result is inconclusive. prior to the model estimation, the unit root test was conducted so as to know the order of integrations of the variables. The methods used in the process were augmented dickey-fuller (ADF) and Phillips-Perron (P-P).

4. DISCUSSION OF FINDINGS

Unit-Root Test:

When the analysis is time series based it is necessary to test the stationarity of the variables so as to pinpoint the order of integration.

Table 4.1: Unit Root Test (Augmented Dickey-Fuller and Phillips-Perron)

Variables	**Augmented**	**Dickey-Fuller**	**Phillips-Perron**	
	Level	First Diff.	Level	First Diff.
LGDPP	-2.0937	-5.2308***	-2.0937	-5.2131***
LALI	-1.3366	-3.9207**	-1.5966	-3.9207**
LALC	-4.1658**	-5.8768***	-4.1726**	-7.8773***
LALP	-2.1131	-4.0067**	-2.1285	-3.8101**
LCBL	-1.7454	-6.0677***	-1.7757	-6.0737***

Note: ***,**and* indicate significant at 1%, 5% and 10% respectively.

Source: Author's computation from Eviews Version 9.

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The result of unit root test in Table 4.1 indicated that agricultural loans to company is stationary at level, this implies that it is I(0), while economic development, agricultural loans to individual, agricultural loans to cooperatives and commercial bank loans to agriculture are non-stationary at level but stationary after first difference means they are I(1). Since the unit root result shows that agricultural loans to company is I(0) and the other two are I(1) ARDL is suitable method to apply (Pesaran et al., 2001) in order to identify whether there exist long-run relationship among the variables using ARDL bound testing procedure.

Cointegration Test:

Table 4.2 shows cointegration results, which revealed that variables have long-run relationship, as the calculated F-statistics value (9.24) is greater than the upper bound critical value for all the significance levels. Based on the result, null hypothesis of no cointegration was rejected and accepted alternative hypothesis at 1% significance level.

Table 4.2: ARDL Bounds Test

Test Statistics		
F-Statistics	9.24	
Critical Value Bounds		
Significance levels	1(0) Bounds	1(1) Bounds
10%	2.20	3.09
5%	2.56	3.49
1%	3.29	4.37

Source: Author's Computation from Eviews Version 9.

Table 4.3: Result of the Estimated Long-Run Coefficients of the ARDL

Dependent Variable: LGDPP

Variables	**Coefficients**	**Std. Error**	**t-Statistics**	**Prob.**
LALI	0.1631	0.0136	14.3587	0.0000
LALC	-0.0577	0.0288	-2.0019	0.0854
LALP	0.0546	0.0206	2.6438	0.0332
LCBL	-0.0225	0.0139	-1.6145	0.1505
C	10.3501	0.0739	140.1245	0.0000

R2 = 0.99, Adj. R2 = 0.99, DW = 1.53, F-Stat.=272.57 (0.0000)

Source: Author's computation from Eviews Version 9.

The result shows that agricultural loans to individual are positive and statistically significant at 1% level. Which translate to mean that an increase (decrease) of individual base agricultural financing will lead to corresponding increase (decrease) in economic development, precisely 1% increase in agricultural loan to individual could leads to an increase in economic development by 0.16% in Nigeria in the long run. Agricultural loans to cooperatives is also negative but significant at 10% level. This implies that an increase (decrease) in cooperative
base financing of agriculture might lead to decrease (increase) in economic development. To be precise, increase in agricultural loans to cooperative by 1% leads to a decline of economic development by 0.06%, that means channeling more funds to cooperative base agricultural financing is a detriment to the development of the Nigerian economy in the long-run. Agricultural loans to company is positive and significant at 5% which means 1% increase in agricultural loans to company could trigger economic development to increase by 0.05%. Therefore, an increase in company base agricultural financing leads to an increase in economic development in Nigeria in the long-run. Commercial banks credits to agriculture is negative and statistically insignificant, meaning that 1% rise in commercial bank's loans to agriculture may lead to a decline in economic development by 0.02% in the long-run in Nigeria.

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The estimation of the short-run result presented in Table 4.4 indicated that both agricultural loans to individual and agricultural loans to co-operative have significant negative impact on economic development, this implies that increase in the financing of agriculture to individual and co-operative could lead to a decline in the economic development in Nigeria in the short-run. However, agricultural loans to company and commercial banks loans to agriculture have significant positive impact on economic development in Nigeria. This implies that an increase in company base agricultural financing and commercial bank's loans to agriculture will lead to increase in economic development in Nigeria in the short-run. The error correction term is less than one, negative and significant at 1% level. This confirms the foregoing long-run nexus among the variables which suggests that economic development is corrected from the short-run towards reaching long-run equilibrium at speed of 99% every year.

Table 4.4: Estimated Short-Run Coefficients of the ARDL Model

Dependent Variable: ΔGDPP

Variables	**Coefficients**	**Std. Error**	**t-Statistics**	**P-value**
Δ(LALI)	-0.0483	0.0174	-2.7721	0.0276
Δ(LALC)	-0.0092	0.0044	-2.0767	0.0765
Δ(LALP)	0.0305	0.0085	3.6128	0.0086
Δ(LCBL)	0.04803	0.0082	5.8095	0.0007
ECM(-1)	-0.9950	0.10207	-9.7483	0.0000
Source: Authors' computation from Eviews Version 9.				

To find out that the model is consistent, diagnostic test such as serial correlation, heteroscedasticity and normality test were conducted and the result is presented in Table 4.5. which specified that the model passed all the three tests. This is due to the fact that the null hypotheses of all the tests cannot be rejected as a result of insignificant p-values.

Table 4.5: Results of the Diagnostic Tests

Test	**Test Statistics**	**Prob. Value**
Serial correlation	1.2079	0.3733
Heteroscedasticity	0.5533	0.8558
Normality	1.2713	0.5296
Source: Authors' computation from Eviews Version 9.		

5. CONCLUSION AND RECOMMENDATIONS

It has been documented that government in Nigeria have over the years established institutions, schemes and programmes in financing agriculture with main theme of achieving inclusive growth and sustainable development. But surprisingly, that has not translated to meaningful development in Nigeria. This is due to presence of factors such as paucity of funds, corruptions, low management capacity, inadequate funding of the forgoing institutions, programmes and schemes among others. It is based on the foregoing that, this study examined the relationship between agricultural financing and economic development in Nigeria using annual data from 1986 to 2015. Financing of agriculture was disaggregated into individual, co-operative and company base agricultural financing. This study further applied Autoregressive Distributed Lag (ARDL) model for the analysis. The results showed that individual and company base agricultural financing have positive impact on economic development, while co-operative base financing and commercial banks loans to agriculture have negative impact on economic development. On the bases of the findings the study recommended the need for government to channel more of its funds to individual and company base agricultural financing and effective monitoring and supervision should be given. Government should ensure up scaling the financial management capacity of the potential loan beneficiaries through training and mentorship. Additionally, commercial banks should redesign their existing policy on how the loans to agriculture are issued, equally effective monitoring and supervision should be given on how the loans are been disbursed and spend.

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